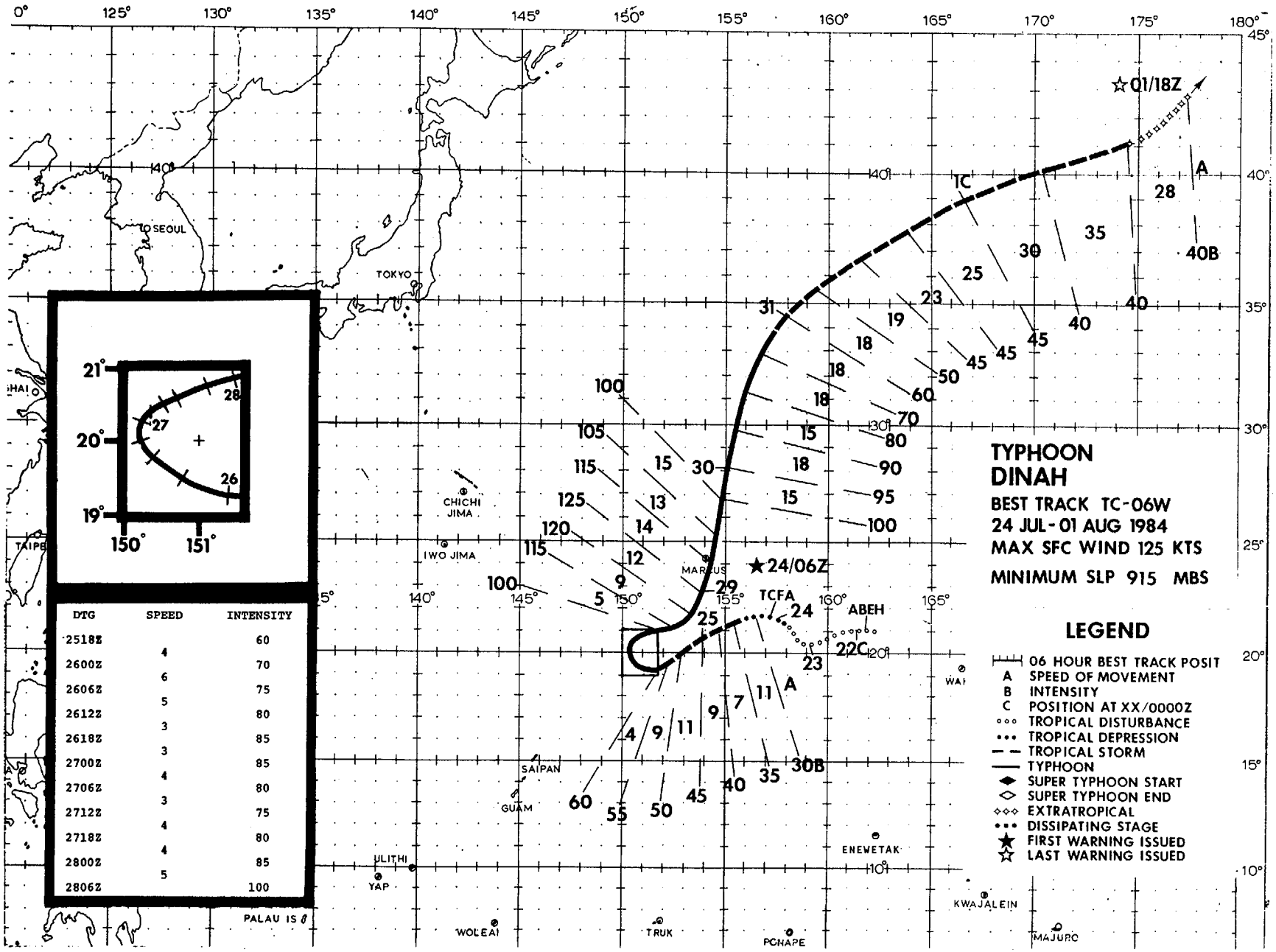

TYPHOON
DINAH
BEST TRACK TC-06W
24 JUL-01 AUG 1984
MAX SFC WIND 125 KTS
MINIMUM SLP 915 MBS
LEGEND
06 HOUR BEST TRACK POSIT
A SPEED OF MOVEMENT
B INTENSITY
C POSITION AT XX/0000Z
TROPICAL DISTURBANCE
TROPICAL DEPRESSION
TROPICAL STORM
TYPHOON
SUPER TYPHOON START
SUPER TYPHOON END
EXTRATROPICAL
DISSIPATING STAGE
FIRST WARNING ISSUED
LAST WARNING ISSUED
☆01/18Z
★24/06Z
TC
TCFA
ABEH
SEOUL
TOKYO
CHICHI JIMA
IWO JIMA
MARCUS
SAIPAN
GUAM
ULITHI
YAP
WOLEAI
TRUK
PONAPE
ENEWETAK
KWAJALEIN
MAJURO
WAI
TAIPEI
PALAU IS
DTG SPEED INTENSITY
2518Z 60
2600Z 4 70
2606Z 6 75
2612Z 5 80
2618Z 3 85
2700Z 3 85
2706Z 4 80
2712Z 3 75
2718Z 4 80
2800Z 4 85
2806Z 5 100

During much of July, the North Pacific was dominated by slow moving or stationary features. After Tropical Storm Betty dissipated over southern China, the southwest monsoon did not re-develop. Instead, surface ridging was established in the South China Sea. Gradually this ridging spread eastward, and by mid-July dominated the western North Pacific from Southeast Asia to the dateline. This anomalous ridging persisted for almost two weeks. Accompanying this ridging was an almost total absence of significant convection in the tropics. With high pressure dominating the climatologically favored area for tropical cyclone development, it was up to a cold front to provide the genesis mechanism for the next storm of the season. This front had persisted for nearly a week, extending across much of the central North Pacific southwestward to just north of Wake Island (WMO 91245). While the southern end of the associated trough had, at times, shown some convective activity, it was not until the front began to move eastward that the disturbance detached from the front and developed into Typhoon Dinah.

On the 20th and 21st, satellite imagery indicated that the trough and its associated surface front, which had been inactive for nearly a week, were finally moving east. As the trough moved eastward, an area of convection remained behind and began to show some organization. Synoptic data at 1200Z on the 21st indicated a surface circulation had formed beneath the convection, approximately

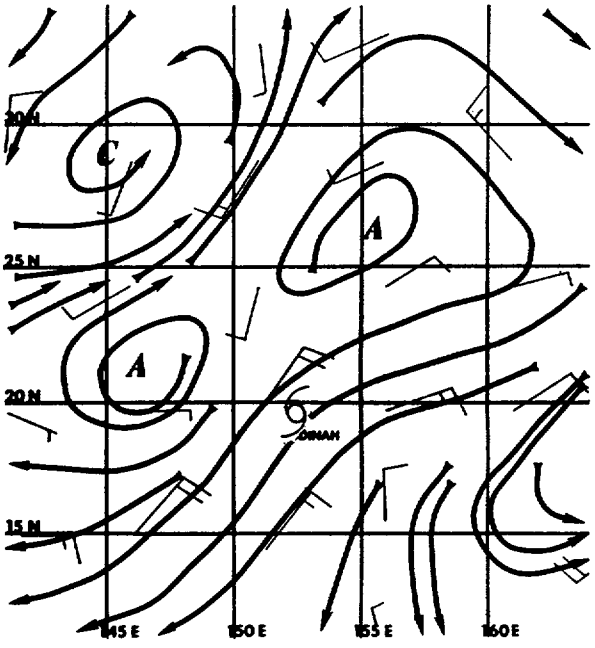


Figure 3-06-1. Mid-tropospheric wind flow which initially steered Typhoon Dinah. Note the ridge to the north with a weakness in the ridge to the northwest (FNOC 400 mb NVA analysis valid at 251200Z July).

300 nm (556 km) to the northwest of Wake Island. During the next two days, the disturbance drifted slowly westward with no significant development. This lack of development and slow movement are attributed to the passage to the north of a developing mid-latitude frontal system which significantly elongated the convection.

Late on the 23rd, with the frontal system passing to the northeast and its influence lessening, the convection associated with the disturbance increased considerably. Based on the 240000Z imagery, a TCFA was issued. As the TCFA was being issued, the first aircraft reconnaissance of the disturbance was already underway. By 240250Z the aircraft had located a 1000 mb circulation center, and had observed surface winds of 30 kt (15 m/s). Since continued development was expected, the first warning on Dinah valid at 240600Z was issued.

During the next two days, Dinah tracked to the west-southwest and intensified. Late on the 25th, Dinah attained typhoon intensity with aircraft reporting that a 30 nm (56 km) wide circular eye had formed. Dinah's track to the west-southwest is attributed to the flow around a narrow mid-tropospheric ridge to its north (Figure 3-06-1). At this time, Tropical Storm Ed (soon to be Typhoon Ed) was moving southeast towards Dinah. This caused the ridge to the north to slide to the east allowing Dinah to turn to the northwest into the weakness.

Between 0000Z on the 26th and 0000Z on the 28th, Dinah and Ed were within 900 nm (1667 km) of each other, with the closest point of approach being at 262100Z when they were approximately 630 nm (1167 km) apart (Figure 3-06-2). While JTWC was warning on these systems it was thought that the major track changes to both were a result of their interaction. However, post-analysis indicates this interaction between Dinah and Ed was not nearly as great a factor as initially thought. It is now believed that the proximity of the storms did not have a major affect on their respective tracks and only a short-lived influence on Dinah's intensity.

Figure 3-06-3 shows the intensity variations of Dinah as measured by reconnaissance aircraft. After intensifying for three days, Dinah weakened for a 12 to 24 hour period on the 27th. This weakening happened after the closest point of approach between the two storms had occurred. The mechanism responsible for this temporary weakening was the well developed outflow of Ed which interacted with Dinah late on the 26th and early on the 27th. Figure 3-06-4 contains a series of three infrared satellite pictures showing the approach and interaction of Ed's outflow with Dinah. This interaction resulted in a significant shearing and suppression of the convection

in the northwest quadrant of Dinah, a temporary weakening of the eye and eyewall and an increase in the central pressure as observed in Figure 3-06-3. Figure 3-06-5 shows an enhanced infrared picture of Typhoon Dinah after interaction with Ed had taken place. Note that the eye is open to the northwest, and there is a lack of significant convection in the northwest quadrant. Although not verifiable, Dinah's brief turn to the east-northeast on the 27th may also be attributable to the pressure from Ed's outflow. By early on the 28th, with the distances between Ed and Dinah increasing, the shearing decreased and Dinah intensified rapidly, reaching its maximum intensity of 125 kt (64 m/s) at 0000Z on the 29th.

By now Dinah was moving to the north-northeast and increasing its forward speed as the storm tracked along the westward edge of the mid-Pacific high. At approximately 290600Z Dinah made its closest point of approach to Marcus Island (Minami Tori Shima (WMO 47991)) with an intensity of 115 kt (59 m/s). This was Dinah's only interaction with land and caused extensive damage to vegetation on the island. The Coast Guard Loran station sustained an estimated $30,000 worth of damage to various buildings and equipment. Maximum observed winds on the island were 63 kt (32 m/s) with a peak gust to 89 kt (46 m/s).

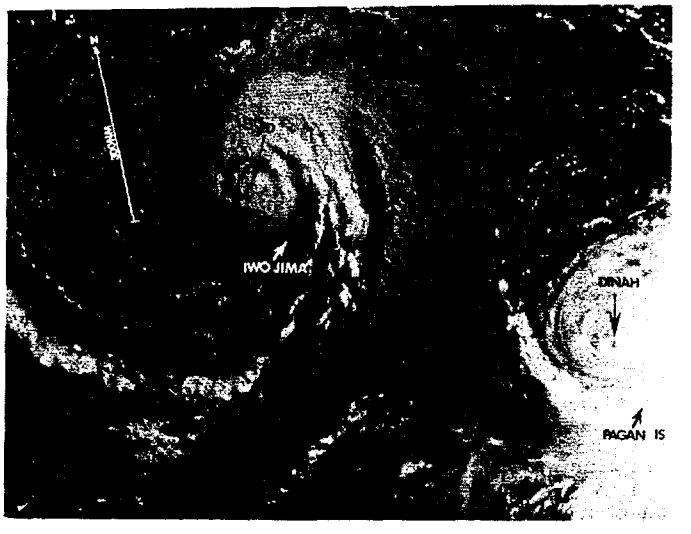
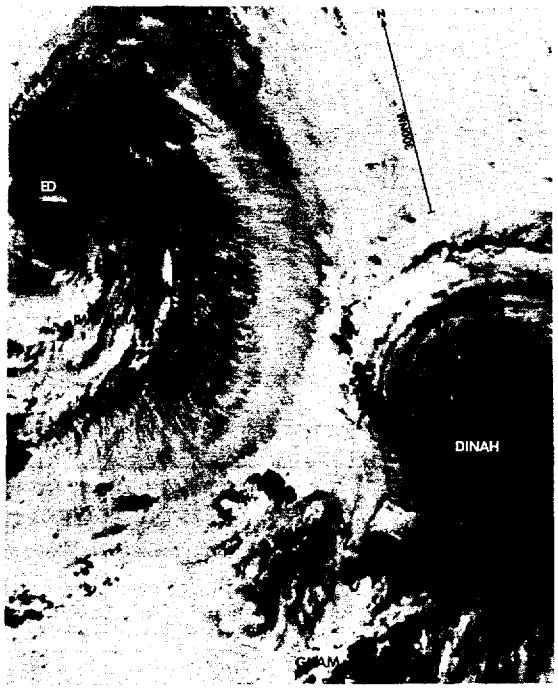


Figure 3-06-2. View of Typhoon Dinah and the developing Tropical Storm Ed (soon to be Typhoon Ed) near the time of their closest point of approach (262213Z July NOAA visual imagery).

Figure 3-06-3. Intensity variations of Typhoon Dinah as derived from aircraft reconnaissance data.

After passing clear of Marcus Island, Dinah continued to move to the north-northeast at 15 to 18 kt (28 to 33 km/hr) and weaken. Early on the 31st Dinah was downgraded to a tropical storm. A mid-latitude trough which had already been interacting with Dinah for approximately 12 hours, now started steering the storm towards the northeast. Transition to an extratropical low, which began at about 1200Z on the 30th, was completed by 1200Z on the 1st of August.

The final warning was issued by the Joint Typhoon Warning Center at 1800Z on 1 August. The extratropical remains of Dinah continued to track eastward across the international dateline.



(a)

(b)

Figure 3-06-4. Three infrared pictures taken during a six hour period showing the approach of Ed's outflow and its interaction with Dinah (a. 261842Z July NOAA infrared imagery, b. 262214Z July NOAA infrared imagery, c. 270037Z July NOAA infrared imagery).

(c)

Figure 3-06-5. Enhanced infrared imagery of Typhoon Dinah after interaction with Ed (270545Z July NOAA infrared imagery).